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(71) Applicant (for all designated States except US): **THE GENERAL HOSPITAL CORPORATION** [US/US]; 55 Fruit Street, Boston, MA 02114 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **KANG, Jing, X.** [US/US]; 28 Meadowood Road, North Andover, MA 01845 (US).

(74) Agent: **CREWS, Lee, Ph., D.**; Fish & Richardson P.C., 225 Franklin Street, Boston, MA 02110-2804 (US).

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(54) Title: COMPOSITIONS AND METHODS FOR MODIFYING THE CONTENT OF POLYUNSATURATED FATTY ACIDS IN BIOLOGICAL CELLS

(57) Abstract: The present invention features compositions (e.g., nucleic acids encoding fat-1, optionally and operably linked to a constitutively active or tissue-specific promoter or other regulatory sequence and pharmaceutically acceptable formulations including that nucleic acid or biologically active variants thereof) and methods that can be used to effectively modify the content of PUFAs in animal cells (i.e., cells other than those of *C. elegans*, for example, avian or fish cells such as myocytes, neurons (whether of the peripheral or central nervous system), adipocytes, endothelial cells, and cancer cells). The compositions and methods include a fat-1 gene that has been modified to include at least one optimized codon. The modified cells, whether in vivo or ex vivo (e.g., in tissue culture), transgenic animals containing them (fish and birds in particular), and food products obtained from those animals (e.g., meat or other edible parts of the animals (e.g., liver, kidney, or sweetbreads)) are also within the scope of the present invention.



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